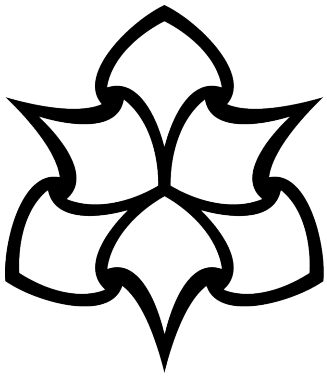

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ICT-enabled Refugee Integration: A Research Agenda

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ICT-enabled Refugee Integration: A Research Agenda

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Abstract:

The recent phenomenon that has become known as the European refugee crisis is, in reality, a global problem. Accordingly, issues regarding refugee integration have become a central debate topic worldwide. In this paper, we examine how refugees use information and communication technology (ICT) in different regions across the world to understand how ICT supports their desperate journey to safety, their stay in temporary settlement camps, and their post-settlement inclusion in host countries. We conducted a series of interviews with Syrian refugees in Berlin, Germany, to collect preliminary insights. Then, we organized panel discussions at two key information systems conferences (ICIS 2016 and ECIS 2017) that involved participants from various countries. The panel discussions revealed seven key research themes: accessibility to information, availability of education and linguistic resources, admissibility to labor markets and entrepreneurship opportunities, communicability with home country, connectedness with local population, interactivity with host government, and volunteer coordination. We discuss how ICT might help to address issues related to each theme, present research questions relevant to each theme, and supply an illustration of how ICT has been employed to address an aspect of each theme. Insights gathered lead to theoretical implications and future opportunities for research in the information systems field, practical implications for different stakeholders interested in refugee integration to consider, and social implications related to refugee crisis that we cannot ignore.

Keywords: ICT, Refugees, Social Inclusion, Integration.

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1 Introduction

The global refugee crisis that has erupted in the last few years presents a formidable challenge to the international community. According to the United Nations High Commissioner for Refugees (UNHCR), the number of people who left their countries or become internally displaced due to conflicts, human right violations, persecution, or violence amounted to approximately 67 million in 2016 (UNCHR, 2017a). This massive number of forcibly displaced individuals not only poses significant economic consequences but also comes with moral and ethical implications that we cannot ignore. Although the international media has labeled this issue as the European refugee crisis, it is a global problem. According to the UNHCR (2017b), by mid-2016, the host countries with the largest number of refugees were Turkey (2.8 million), Pakistan (1.6 million), Lebanon (one million), Iran (978,000), and Ethiopia (742,700), Jordan (691,800), Kenya (523,500), Uganda (512,600), Germany (478,600), and Chad (386,100). From the above figures, we can see that non-European countries carry the heaviest burden, especially with respect to the disproportionate number of refugees they shelter relative to their own population and the potential disruptive impact on their economy and society. However, the number of refugees that different countries host only partly tells the story of the struggles that confront these forcibly displaced individuals. Though the media has widely shown images that depict overloaded boats crossing the Mediterranean Sea, for refugees who managed to complete the odyssey, landing on southern European shores marks only the beginning of a much longer and treacherous journey en route to their final destination. Approximately 2.3 million Venezuelans have experienced a similar predicament: they have had to relocate to other South American countries (primarily Colombia, Peru, Chile, and Argentina) where they live under a form of "alternative legal stay" that allows them, at least temporarily, to live and engage in economic activities in their host countries (Freier & Parent, 2018). When in transit, refugees are in a state of legal limbo, which the terms to which the media refers to them reflect, such as "asylum seekers", "persons in need of international protection", "transit migrants", and "vulnerable migrants" (Kilibarda, 2017). As such, refugees, who live in settlement camps and await relocation to a host country, do not enjoy "the legal protections enshrined in international, regional, and domestic laws" (Holzer, 2013, p. 865).

Against this backdrop, we delve into how refugees leverage information and communication technology (ICT) in various regions across the world. Particularly, we focus on gleaning insights into the role that ICT plays in supporting refugees' desperate journey to safety, temporary refuge settlement camps, and post-settlement inclusion in host countries. To sensitize the information systems (IS) community to the relevance of this topic, we organized panel discussions at two leading conferences: the 37th International Conference on Information Systems (ICIS 2016) (AbuJarour et al., 2016) and the 25th European Conference on Information Systems (ECIS 2017) (AbuJarour et al., 2017). We were pleased with the enthusiastic response from our colleagues who engaged in a candid and fruitful academic conversation that focused on addressing this pressing societal challenge.

This paper proceeds as follows: in Section 2, provide background information about how marginal groups in general and refugees in particular use ICT. In Section 3, we describe the panel discussions. In Section 4, we explain the seven derived research themes. In Section 5, we highlight implications for theory and practice and avenues for future research. In Section 6, we conclude the paper.

2 Background

In preparation for our panel discussions, we reviewed extant literature on marginalized groups' ICT use, especially the few works that touch on the role that ICT plays in refugee integration (AbuJarour & Krasnova, 2017; Díaz Andrade & Doolin, 2016; Caidi, Allard, & Quirke, 2010). Through our literature review, we could more deeply understand how asylum seekers and resettled refugees exploit ICT. We used this understanding to assess the current state of knowledge on ICT-enabled refugee integration and, thus, formulate a future research agenda.

2.1 ICT for Marginalized Groups

With the increased ubiquity of ICT, research into how ICT can aid marginalized groups has gained momentum (Qureshi, 2015, 2017). Even though researchers have conducted most IS research on this topic in Western settings (De Vreede, Mgaya, & Qureshi, 2003), which limits the transferability of lessons learnt to marginalized groups in developing countries or to refugees settling into non-Western host countries, some notable and recent work has focused on shedding light on the role that ICT plays in helping marginalized groups in developing countries. Specifically, we identify three primary research

streams on the effects that ICT has for marginalized groups according to whether they emphasize how ICT can: 1) bolster the accessibility of services for marginalized groups or people from remote communities 2) enable marginalized groups to exchange information and collaborate, and 3) bridge social divide and promote social inclusion.

Past studies have attested to the importance of ICT in enhancing the **accessibility** of services for marginalized groups or people from remote communities. Coupled with advances in mobile technology, ICT can empower individuals—especially people from rural communities in developing countries (McGrath, 2016)—through enhanced access to education, healthcare, and/or other governmental services (Oreglia & Srinivasan, 2016; Venkatesh, Shaw, Sykes, Wamba, & Macharia, 2017). Through affording better accessibility to services, ICT has the potential to not only boost a country's productivity but also contribute to individuals' wellbeing (Ganju, Pavlou, & Banker, 2016). For example, eHealth kiosks (Venkatesh, Rai, & Sykes, & Aljafari, 2016) and information sharing among midwives (Niemöller et al., 2016) can reduce infant mortality, a major challenge in rural communities in developing countries

Additionally, ICT facilitates communication and **collaboration** in marginalized groups and between marginalized groups and the broader society (De Vreede, Mgaya, & Qureshi, 2003). By granting access to accurate and timely information and facilitating communication among individuals, ICT holds substantial promise for marginalized groups, especially in developing countries (Ahmed, 2007). For example, with ICT, farmers can not only access information on farming practices (Venkatesh & Sykes, 2013) but also share experiences with their peers (Jha, Pinsonneault, & Dube, 2016). Likewise, ICT can facilitate interaction and cooperation not only between marginalized groups and governmental agencies but also among governmental agencies and other focal stakeholders (Lim, Tan, & Pan, 2007). E-government projects entail significant collaboration challenges where ICT can serve as part of the solution (Fedorowicz, Gogan, & Culnan, 2010; Fedorowicz, Gogan, & Williams, 2006).

Finally, ICT can **bridge the social divide** and promote social inclusion by allowing individuals to develop to their fullest potential and become active members of society. The social divide has multiple facets that differ between developed and developing countries. For instance, ICT can encourage entrepreneurship in rural communities and developing countries, which one can see in the Taobao Villages in China (Leong, Pan, Newell, & Cui, 2016) and in Uganda (Betts, Bloom, and Weaver, 2015). However, women and African Americans continue to experience career difficulties in the ICT industry and the IS community (Cain & Trauth, 2015; Trauth, Cain, Joshi, Kvasny, & Booth, 2016). Consequently, concerted efforts have to be undertaken to improve the inclusivity of the community of IS professionals and researchers and the design of ICT itself (Olbrich, Trauth, Niederman, & Gregor, 2015).

2.2 ICT in the Context of Refugee Integration

We recognize that the term refugee does not always refer to a homogeneous group of individuals. The forcibly displaced individuals in refugee camps and resettled refugees in host countries often come from diverse countries, belong to diverse ethnic groups, have diverse religious beliefs and educational backgrounds, and so on. Nevertheless, all refugees share the burden of stigmatization because the media generally portrays them as vulnerable individuals or welfare recipients (Ludwig, 2016).

Regardless of the legal status that refugees have in the country that temporarily shelter or permanently resettle them, countries have the paramount moral imperative to respect their human dignity. Far from devising interventions or policies to acclimatize refugees to local traditions, countries should uphold their right to belong in a new society and, at the same time, to maintain their cultural identity (Gifford & Wilding, 2013).

We posit that ICT can play an instrumental role in easing refugees' integration into their host countries and in helping them to build a new life for themselves. Diaz Andrade and Doolin (2016) demonstrated that using ICT culminates in greater opportunities for refugees "to exercise their agency and achieve improvements in their well-being that enhance their participation in society and control over their circumstances" (p. 412). Thus, ICT delivers conditions conducive to social inclusion by empowering individuals "to fully participate in society and control their own destinies" (Warschauer, 2003, p. 8). Through information accessibility, refugees have more opportunities to engage in the social, economic, and political activities of their host countries while maintaining a connection to their past that reinforces their cultural identity (Díaz Andrade & Doolin, 2019).

3 The Panels

In this section, we explain: 1) why we organized the discussion panels, 2) the panelists we invited, (3) the format that the panel discussions adopted, and 4) how we analyzed the panel discussions to derive research themes to guide future studies on ICT-enabled refugee integration. The two panels built on each other. The first panel raised awareness about how technology can bring about refugee integration. After the first panel and in preparation for the second panel, we empirically validated the developed ideas and questions and augmented them with best practices to structure the topic area and develop an agenda to discuss in the second panel.

3.1 Organizing the Panels

We organized the first panel, titled "Leveraging Technology for Refugee Integration: How Can We Help?" (AbuJarour et al., 2016), at ICIS 2016 in Dublin, Ireland. In the panel, we focused on generating discussion among experts about how one could harness knowledge accumulated in the IS community to design targeted technological solutions to tackle the refugee crisis and avert potential risks that accompany it. In preparation for this panel, the first author conducted 15 face-to-face interviews with Syrian refugees in Berlin, Germany, in March, 2016, to elicit insights from refugees on how they have used various types of ICT and their needs for technological solutions. We used the preliminary findings we gained from thematically analyzing the interview transcripts as obtain key directions for structuring the panel discussion. We carefully selected panelists with expertise in the areas of e-government, ICT adoption, refugee integration, and social inclusion to fit the panel's scope.

We organized the second panel titled "Empowering Refugees with Technology: Best Practices and Research Agenda" (AbuJarour et al., 2017), at ECIS 2017 in Guimarães, Portugal. In the panel, we focused on formulating a research agenda to guide future studies on refugees' ICT use on a deeper level and to solicit best practices on how one can leverage ICT to effect integration and social inclusion. To do so, we carefully selected panelists with expertise in e-government, ICT adoption, refugee integration, and social inclusion to fit the panel's scope. Moreover, despite logistical constraints, members in both panels not only represented diverse backgrounds and geographical regions but also held broad opinions about ICT's societal impact.

3.2 Panelists

Table 1 lists the people, in alphabetical order, who participated in one or both panels.

Table 1. List of Panelists

Panelist	Role	Panel
Safa'a AbuJarour Business Information Systems, University of Potsdam and Weizenbaum Institute for the Networked Society, Germany	Panelist	ICIS 2016, ECIS 2017
Antonio Díaz Andrade Business Information Systems, Auckland University of Technology, New Zealand	Panelist	ECIS 2017
Jane Fedorowicz Information and Process Management, Bentley University, USA	Panelist	ICIS 2016
Hanna Krasnova Business Information Systems, University of Potsdam and Weizenbaum Institute for the Networked Society, Germany	Moderator	ICIS 2016, ECIS 2017
Sebastian Olbrich Information Systems and Digital Business, European Business School, Germany	Panelist	ICIS 2016, ECIS 2017
Chee-Wee Tan IT Management, Copenhagen Business School, Denmark	Panelist	ICIS 2016, ECIS 2017
Cathy Urquhart Operations, Technology, Events and Hospitality Management, Manchester Metropolitan University, UK	Panelist	ICIS 2016, ECIS 2017
Viswanath Venkatesh Information Systems, University of Arkansas, USA	Panelist	ICIS 2016
Manuel Wiesche Information Systems, Technical University Munich, Germany	Panelist	ECIS 2017

3.3 Format and Structure

We held the panels in an **interactive format** in which both panelists and the audience engaged in an open dialogue.

In each panel, one moderator and six panelists participated in the discussion (see Table 1). The ICIS panel lasted one-and-a-half hours and the ECIS panel lasted two hours. The panels had the same structure. The moderator began by introducing the panelists before outlining the topic for discussion and the panel's goals. Each panelist then presented their opinion on the topic. Subsequently, the moderator invited the audience to interact with the panelists by asking questions and/or sharing their views on the points that the panelists raised. Finally, the moderator summarized the core findings that emerged from the panel discussion.

3.4 Analysis of Panel Discussions

We audio- and video-recorded the panels in their entirety. We transcribed and edited the recordings for precision. We then coded these transcripts into research themes to structure this report.

For the thematic analysis, we adhered to an iterative comparison method (Strauss & Corbin, 1990) whereby we read through a sample of the transcripts before developing a preliminary codebook. After coding a sample of transcripts, we refined the codebook and clarified ambiguities in interpretation among ourselves. Next, at least two authors independently coded each transcript, which culminated in a list of 88 codes throughout both panels. As we extracted and merged thematic codes into abstract theoretical categories, we paid particular attention to research themes that reflected asylum seekers' and refugees' ICT use, such as how it contributed to their perceptions about integration and social inclusion. Through the thematic coding exercise, we derived seven research themes: 1) accessibility to information, 2) availability of education and linguistic resources, 3) admissibility to labor markets and entrepreneurship opportunities, 4) communicability with home country, 5) connectedness with local population, 6) interactivity with the host government, and 7) volunteer coordination. We elaborate on each of these themes in Section 4.

4 Research Themes

In this section, we elaborate on the research themes that emerged from the panel discussions. For each research theme, we first articulate related issues and how ICT can help to address them. Then, we present relevant research questions. Finally, we illustrate how ICT has been employed in a real-life case to foster theoretical development. Although most examples illustrate German initiatives, other host countries contain many other instances of comparable services.

4.1 Accessibility to Information

The first research theme focuses on how ICT can help refugees access information. Once refugees arrive in a host country, they require timely information on various topics: basic aspects of the daily life such as Internet access or money transfer, the first steps of the asylum process and the relevant points of contact, access to healthcare, their options to learn the local language, and how to access education for adults and children. Unfortunately, this information is distributed among a large number of heterogeneous actors, such as asylum counselors, social assistance offices, youth welfare offices, local non-government organizations, and volunteers. In Germany, due to the federal administration structure, agencies' regulations and responsibilities differ from state to state or even from county to county. In addition to the high heterogeneity of the information sources, the information is dynamic and, in some cases, quickly outdated. Local points of contact change, new offers emerge, and the asylum process changes. Furthermore, once refugees have been relocated from the initial reception facility, they may have partially outdated information. In addition, the fact that refugees cannot access all information in their native language poses a further challenge to their accessing the right information.

ICT can contribute to solving the information chaos that refugees face. Following the information-management paradigm of providing the right information at the right place at the right time (Krcmar, 2015), ICT can bring together information providers to make information available to refugees through digital channels. Here, the refugees' mobile devices represent a promising channel to distribute information. Furthermore, ICT offers various tools to make information accessible to a larger group of users. For

example, frameworks make it relatively easy to implement Web or mobile solutions in multiple languages, and translation engines can support the translation itself.

Given this background, we propose the following research questions related to this theme for researchers to explore in the future:

- What information arrangements can best support unstructured information that a heterogeneous user group uses on an irregular basis?
- How can information be displayed in ways that users with different languages, cultural backgrounds, and information literacies can access?
- What role can government agencies and non-government organizations play in creating information that refugees find relevant?
- What technical architecture best allows one to store and distribute information that refugees find relevant?

4.1.1 Illustration

The mobile app Integreat[1] provides relevant information to refugees via a smartphone application. The app comprises both general and specific information that pertains to the respective municipality. Users choose the municipality according to their location when they open the app. Users can also access the information that the app provides offline. Refugees usually have only sporadic access to the Internet since they use local Wi-Fi hotspots and generally do not have mobile service. The app also comes in several different languages (e.g., English, French, German, and other languages from regions that refugees often originate such as Arabic and Farsi) (Schreieck, Wiesche, & Krcmar, 2017a; Schreieck, Zitzelsberger, Siepe, Wiesche, & Krcmar, 2017b).

4.2 Availability of Education and Linguistic Resources

The second research theme focuses on how ICT can help refugees educate themselves and access linguistic resources. Education and the ability to communicate in the local language represent key requirements for social inclusion. Refugees in particular need to adequately communicate in the local language because the asylum process itself requires them to communicate with different groups such as local authorities, government offices, local citizens, and volunteers. However, asylum seekers typically lack the qualifications to participate in educational programs or language-learning programs until they have completed the asylum-application process and received asylum. Further, refugees who do have educational qualifications and certificates from their home country often face difficulties in obtaining recognition for them in their host country. Therefore, refugees turn to e-learning opportunities to acquire some level of language learning and to participate in open education programs (AbuJarour & Krasnova, 2018).

Here, ICT emerges as a means to alleviate this accessibility challenge since it can provide mobile applications and massive open online courses (MOOCs). MOOCs attract the attention of millions of online learners worldwide by providing easy and ready access to education. These learners include refugees, who use these applications to start learning a local language (e.g., YouTube videos) or to participate in online courses to acquire credits that they may use later at university.

Based on this background, we propose the following research questions:

- What ICT infrastructure(s) can best support refugees in learning a host country's local language?
- How can ICT help to broaden refugees' learning opportunities?
- What role can technology play in motivating refugees to participate in the educational system in their host country?

[1] https://integreat-app.de/

4.2.1 Illustration

Kiron[2] University for Open Higher Education for Refugees allows refugees to access higher education through digital solutions. The project started with an idea from two initiators during a refugee conference in 2014 where they discussed their vision for a "university 2.0". This idea focuses on using technology to provide custom-made educational opportunities for individual refugee students.

4.3 Admissibility to Labor Markets and Entrepreneurship Opportunities

The third research theme focuses on how ICT can help refugees access labor markets and entrepreneurship opportunities. Participating in the job market represents a key determinant and indicator of integration success. Having access to paid employment, equal opportunities in the labor market, and high-quality employment improves an individual's inclusion in society. In the refugee context, being able to work enables refugees to become economically independent and allows them to further develop their language skills, enhances their self-esteem and wellbeing, and encourages self-reliance (AbuJarour, Krasnova, & Hoffmeier, 2018; Ager & Strang, 2008). However, multiple obstacles prevent refugees from entering the local job market, such as formal restrictions (e.g., possibility to enter job market only after attaining asylum status), obstacles for social integration (e.g., language), and local community's resistance to foreigners (e.g., only 10% foreign labor allowed).

The entrepreneurial spirit among refugees represents a notable phenomenon in the current refugee situation (Copley, 2016; Parater, 2016). Therefore, businesses should develop specialized programs for refugees that not only shape their skills and qualifications to fit the local job market but also offer skills and information to start their own business. Despite a rising number of initiatives that serve this purpose, many challenges remain. For instance, many refugees struggle with receiving recognition for their qualifications. Furthermore, regulations for issuing work permits remain ambiguous, and many refugees have to wait for their host country to complete their asylum application to obtain a work permit, which can take a long time (AbuJarour & Krasnova, 2017).

ICT can play a crucial role in overcoming the employment obstacles that refugees experience. One solution involves creating platforms to match employers and refugees across country boundaries. Using ICT's matchmaking abilities, we could build platforms that match refugees' CVs with employers via appropriate ICT solutions. However, it remains unclear whether these applications should anonymize individuals to avoid any stereotyping in the matching process. Another challenge concerns compliance with Europe's General Data Protection Regulation (GDPR), which deals with the issue of privacy.

Against this background, we propose the following research questions:

- What opportunities and challenges exist to leverage technology to support refugees in exploring employment opportunities and motivating them to participate in the job market of their host country?
- How can refugees draw on ICTs to participate in economic activities in their host country?
- How can businesses harness ICTs, including mobile applications and social media, to match refugees' skills with available job vacancies?
- What role can technology play in facilitating and fostering entrepreneurship opportunities for refugees in their host country?

4.3.1 Illustration

Backed by the German and Turkish governments, a consortium of ICT companies established a project called the Education Programme for Syrian Refugees and Host Communities[3] in Gaziantep, Turkey. The project focused on promoting employment and entrepreneurship for mainly Syrian refugees in Turkey's digital industry. More tangibly, the project focused on: 1) determining refugees' education levels and, in particular, their IT-related skills; and 2) aligning educational programs with refugees' interests and Turkey's and Germany's market needs. Syrian refugees' language skills (i.e., Arabic) proved to be particularly useful as Turkish IT companies provide many services to the Middle East. Combined with

[2] https://kiron.ngo/
[3] https://www.giz.de/en/worldwide/40562.html

training on how to design IT products, the program (in the refugee camp and via online courses) proved to boost the local IT-sourcing industry.

4.4 Communicability with Home Country

The fourth research theme focuses on how ICT can help refugees communicate with their home country. ICT creates new capabilities for communication because it enables refugees to better connect to their friends and family back home. This connection gives refugees much-need emotional support, a feeling of security, and better social and physical health. In turn, these things help them to better engage with the local community, have a smoother social inclusion process, and have a more successful integration. AbuJarour et al. (2018) found that refugees mainly achieve interpersonal communication through ICT. In particular, refugees widely use mobile applications such as online instant messages and social media to communicate with their families back home because ICT provides cost-efficient synchronous and asynchronous communication capabilities that fulfill their various needs.

Against this background, we propose the following research questions:

- How do refugees use social media applications to connect with their families and friends back home? What distinguishing features do these social media applications have?
- To what extent can one deploy ICTs to help refugees feel socially connected with their home country and, at the same time, maintain cultural knowledge of the host country?
- To what extent do ICTs compensate for lack of face-to-face contact? Can emotional proximity overcome physical distance and other barriers?
- How can one employ ICTs to sustain the cultural identity of refugee communities and, at the same time, assist in their integration in their host country?

4.4.1 Illustration

According to Vernon, Deriche, and Eisenhauer (2016), refugees most often use the apps Facebook Messenger[4] and WhatsApp[5] to communicate with their family members and friends back in their home countries. These two apps facilitate synchronous and mass communication in a cost-efficient manner—a crucial consideration for refugees to fulfill their needs in the new society (AbuJarour & Krasnova, 2017).

4.5 Connectedness with Local Population

The fifth research theme focuses on how ICT can help refugees connect the local population. Humans have a basic need to connect to others, such as their family, friends, colleagues, and other social groups. In the case of refugees, social connectedness strongly relates to practical and emotional support and is, therefore, essential for their social inclusion. Being connected to and making friends with locals and participating in the local community leads to a sense of belonging (Beiser, Goodwill, Albanese, McShane, & Kanthasamy, 2015). By interacting with a network of locals, refugees feel less stressed in the acculturation process and learn more about the host society and its values and cultural practices—features that have positive links to refugees' social inclusion (AbuJarour et al., 2018).

From an ICT perspective, refugees need platforms that allow themselves and locals to find and communicate with each other and to obtain benefits from available resources. For example, a platform could provide a list of locals who have agreed to provide different types of resources (e.g., shelter, food, and financial aid). Then, by using ICT's matchmaking capabilities, refugees and locals could find each other so that whoever needs those resources could access them. As another example, a platform could list joint events that both refugees and locals might find interesting and provide them with the opportunity for to arrange their own personal gatherings.

Against this background, we raise the following research questions:

- How can one use ICT to support integration between refugees and locals?
- How can ICT help refugees better understand the host society, its traditions, and its social practices?

[4] https://www.messenger.com/
[5] https://www.whatsapp.com/

- What impact can ICT have on refugees' long-term integration via interactive platforms that bridge refugee communities with the local population?

4.5.1 Illustration

The charitable organization Start with a Friend[6] helps refugees participate in society. It supports refugees by pairing them with locals into so-called "tandem partnerships". It brings refugees together with locals who can help the refugees "one on one" with the new challenges they face in Germany. The organization believes that integration can only work if people get a chance to play an active role in society. They promote personal and uncomplicated encounters that can lead long-term connections as equals.

4.6 Interactivity with the Host Government

The sixth research theme focuses on how ICT can facilitate interaction and communication between governments and refugees. Refugees usually interact with the host country's government and agencies first when they arrive. They need to register as asylum seekers and follow the formal asylum process. The asylum process involves different governmental institutions at the local, provincial, and federal levels, which leads to a high degree of bureaucracy. In Germany, ICT does not sufficiently support this process. As a result, refugees struggle to follow the steps of the asylum process and often need to rely on asylum counselors. Sometimes, services lack even basic accessibility, such as with forms that exist only in German and English. Such issues do not pertain only to the asylum process: they emerge across virtually all government services that refugees use once they have resettled into the host country and hinder them from, for example, interacting with government agencies, signing up children for school, and applying for housing.

ICT could help host countries provide government services in at least two ways. First, consolidating information and data management across different levels of governments would help to ease the multiple bureaucratic processes refugees must go through. Instead of manually filling out forms with the same information over and over again, the government could have digital files for refugees that all governmental and other authorized agencies could access. Second, the government could provide mobile government services because the large majority of refugees have access to mobile devices. As just two examples, a mobile app could provide forms that refugees could fill out digitally, and a booking tool could facilitate access to language courses. However, approaches that governments initiate often take a substantial amount of time to implement. In contrast, approaches that third parties such as non-government organizations initiative could provide more readily available bridging technologies.

Against this background, we raise the following research questions:

- What aspects of bureaucratic processes do refugees find most challenging and how ICT help facilitate these processes?
- How can governments enable bottom-up initiatives for ICT-enabled solutions for asylum seekers, refugees, and resettled refugees?
- What insights from providing government service in remote regions through mobile devices can one transfer to refugees' situation?
- How can government services leverage emerging technologies, such as distributed ledger technology or machine learning, for refugees?

4.6.1 Illustration

The app BureauCrazy[7], which Syrian refugees in Germany designed, helps refugees cope with bureaucracy. The app includes a translation service to translate German official documents into Arabic and English, a multiple-choice decision tree for frequently encountered issues, and a map that shows the location of council offices (Oltermann, 2016).

[6] https://www.start-with-a-friend.de
[7] https://www.bureaucrazy.de/

4.7 Volunteer Coordination

The last research theme focuses on how ICT can assist volunteers who want to help refugees integrate into society. In host countries such as Germany, many volunteers support refugees by, for example, organizing language courses, accompanying refugees to doctor appointments, or organizing joint sports activities. In that context, two major challenges arise. First, volunteers usually do not coordinate their initiatives with one another and, thus, might offer overlapping services that compete for participants where collaboration would be more useful. Second, most volunteers cannot sustain their efforts over time and, thus, some initiatives end abruptly. In particular, the peak of the refugee influx in Germany in August, 2015, triggered thousands of volunteers to organize supporting initiatives. However, when the holiday season ended and the media attention decreased, volunteer engagement decreased.

ICT can help to tackle these challenges and maximize the impact of volunteers' valuable efforts in at least two ways. One, social networks can help volunteers coordinate different initiatives. For example, in 2015, a Facebook group emerged that coordinated activities and initiatives at the Munich Central Station where several thousands of refugees arrived in days. Two, ICT can help team members manage the knowledge in initiatives, which can reduce the negative impact that arises when they lose members.

Against this background, we propose the following research questions:

- How can one manage distributed (i.e., not physically co-located) volunteer teams compared to how can manage distributed teams in for-profit contexts?
- How can non-profit, ICT-enabled initiatives be set up and governed to alleviate volunteer fluctuation?
- What factors contribute to the sustainability of volunteer initiatives and what role does ICT play in sustainability?

4.7.1 Illustration

The project Integreat[8] provides a mobile application with important information for refugees. To develop and maintain the app, Integreat has brought together a group of volunteers. Since the start of the project in 2015, the volunteers (mostly students) have changed frequently mostly because graduated and started working. The project overcame these challenges by establishing knowledge management and an onboarding process for new team members. The team also applied communication tools, such as Slack, to facilitate collaboration in distributed teams such that team members who moved to other cities could contribute to the project.

5 Future Opportunities for Theorizing in the IS Field

By observing how ICT enables refugee integration or by participating in related projects, IS researchers can find many opportunities to enhance existing theories or develop new theories on ICT design and use in the refugee context. In discussing ICT-enabled refugee integration, we address recent calls to extend IS research to cover grand challenges (such as the ones that the AIS Grand Vision Project for the ICT-enabled Bright Society addresses), calls to address societal challenges (Ketter, Padmanabhan, Pant, & Santanam, 2017; Oh, Acquisti, & Sia, 2018; Sahay, Sein, & Urquhart, 2017) and social aspects (Qureshi, Pan, & Zheng, 2018; Davison, 2016), and calls for new theorizing (Lee, 2015; Burton-Jones, Butler, Scott, & Xu, 2018). In this section, we outline several directions as opportunities for theorizing that we consider worthwhile to pursue.

When developing ICT to help refugees integrate into a host society, research and practice lack guidance on designing intercultural systems and using visual aids. Warschauer (2003) points out that computer literacy, information literacy, multimedia literacy, and computer-mediated communication literacy represent different concepts. Alam and Imran (2015) cite in their study that computer literacy, information literacy, and the English language can all form a barrier. For many refugees, the predominance of English on the Internet can cause issues because they cannot completely use that language (Lloyd, Anne Kennan, Thompson, & Qayyum, 2013). If differences in literacy prove pivotal to allowing refugees to use information systems, we suggest intercultural systems design could take a literacy perspective. Further,

[8] https://integreat-app.de/

better understanding how visuals might cross literacy borders could serve as a central tool for intercultural understanding: some symbols are universal; thus, designers can use them in interfaces where literacy may pose an issue.

Future research could explore how temporal and spatial proximity affects how refugees use ICT. Bengtsson (2014), in her work on virtual ethnographies, argues that we need to consider distance as having two dimensions: physical and cultural. Similarly, we can understand proximity as physical closeness and emotional closeness. Although ICTs allow temporal proximity in that we can experience things at the same time, temporal rhythms due to different routines (and time zones) also affect the experience (Bengtsson, 2014). How might these dimensions play out for refugees who regularly contact their home country? We can ask a similar question about the interaction among former refugees who shared many years of their lives in refugee camps before they resettled in different countries.

Additionally, governments and not-for-profit organizations need to better use ICT to share data and improve internal communication—particularly to support refugees given the urgency with which they need help and the breadth of help they require. Government systems developers rarely use a user-driven approach to ICT application development, often what researchers might label as a narrow "design science" approach (Fedorowicz & Dias, 2010): they develop applications, test functionality, and hand it off to the requesting agency. They give little consideration to the "socio" element of the sociotechnical implementation process, and great consternation arises when the result proves unsatisfactory (Lyytinen & Newman, 2008; Brooks, Bodeau, & Fedorowicz, 2013). Researchers should not fall into this same trap in designing ICT for refugees. Design science researchers should follow a human-centric approach to ensure they identify a real need before beginning to design a system. When the ICT solution addresses this need and provides value, researchers can build on it to redesign the social process around the ICT to fit with the problem and its proper use.

Given the large number of people forced to leave their countries in the recent refugee crisis, researchers and practitioners currently focus on urgent issues such as coordinating volunteers, helping refugees understand their new country, and helping them undertake the first steps of integration. Future research should also address the long-term consequences, such as how ICT resources help refugees build capability and, thus, obtain agency in their quest for social inclusion, and examine how temporal agentic orientations shape patterns of ICT-mediated information practices among resettled refugees (Díaz Andrade & Doolin, 2016, 2019). Design science research could develop solutions for different aspects of life that refugees experience during their resettlement or focus on a specific aspect, such as learning their host country's language, finding opportunities for education, engaging in economic activities, accessing public services, and providing options for cultural expression.

Researchers should incorporate future research on ICT-enabled refugee integration into the body of knowledge that the IS field has already acquired. For example, IT adoption, intercultural interface design, and information management represent well-developed research topics in the IS field. Researchers need to work on contextualizing the issues that affect refugees in terms of specific characteristics and using our knowledge of the interplay between technology and people in order to contribute to solutions to pressing societal problems.

From a methodological perspective, both inductive and deductive approaches can shed light on how the process whereby refugees try to regain control over their disrupted lives implicates ICT. ICT use by refugees is a relatively new phenomenon; it has emerged due to the confluence of the current refugee crisis and the ubiquity of digital technology. Because refugees find themselves in unfamiliar environments and have often suffered from traumatic experiences in their home countries or during their escape, research needs to consider the contextual conditions of ICT use in different stages of their journeys (e.g., en route during their escape or after arriving in their host countries). Studies grounded in empirical data help to explain why and how refugees use ICT. In this vein, grounded theory enables researchers to rely on diverse data from the field such as interviews, observations, ethnographies, pictures, and videos (Urquhart, 2013). Although grounded theory studies ultimately focus on creating theory, intermediate results such as rich descriptions of phenomena or models that provide abstractions of the phenomena can also prove useful as first steps that lead to a theory (Urquhart & Fernandez, 2013; Wiesche, Jurisch, Yetton, & Krcmar, 2017). For instance, Díaz Andrade and Doolin (2016) inductively identified patterns of ICT use among resettled refugees in New Zealand and their meaning in terms of social inclusion based on data they collected through semi-structured interviews. In a subsequent study, Díaz Andrade and Doolin (2019) combined an inductive logic with a deductive approach to map emergent patterns in how resettled refugees used ICT against information practices (cf. Caidi et al., 2010; Savolainen, 2008) to uncover how

refugees' agentic orientations towards the past, present, and future shape these ICT-mediated information practice patterns (cf. Emirbayer & Mische, 1998). Similarly, action research suits research that not only examines refugees' ICT use but also contributes to projects to help refugees. Action research refers to "a post-positivist social scientific research method, ideally suited to the study of technology in its human context" (Baskerville & Wood-Harper, 1996). In action research, researchers directly participate in the case or phenomenon under study. By manipulating certain elements, they can directly observe the effects of those manipulations. If necessary, action research can help researchers gain insights into a phenomenon and to directly apply the knowledge in practice to advance a project (Mathiassen, 2002). For example, Schreieck et al. (2017b) conducted an action research study to analyze how one can incentivize information providers to participate in an information platform for refugees. They gained insights by studying and improving the governance strategies that the project *Integreat* used; thus, the action research study also contributed to the project itself by improving its governance strategies.

No matter what methodology researchers choose, they need to incorporate the context when developing theories. In particular, researchers have shown the value of context for theory development in IS research, such as in increasing richness and relevance to practice (e.g., Hong, Chan, Thong, Chasalow, & Dhillon, 2014; Johns, 2006), especially in the developing-country context. Studying how ICT can support refugee integration clearly constitutes a context-specific phenomenon. Indeed, to be a refugee means that one has settled in a foreign country and, in many cases, away from one's family members and friends and with trauma from previous experiences. Also, host countries differ from one another in that some societies more openly integrate refugees than others. The user population's mobility represents another key confounding factor in many of the themes we identify, and researchers may crucially need to incorporate such contextual factors when developing theory.

Lastly, while encouraging bottom-up research on ICT-enabled refugee integration, we also highlight challenges that we have experienced. Conducting bottom-up research requires insights into refugees' daily life, but obtaining that access is challenging and time consuming. Organizational difficulties arise when, for example, authorities impede access to initial reception facilities or relocate study participants on short notice. Language barriers also make it difficult to gather qualitative data, such as from interviews. Working with interpreters can help assuage such barriers, but still one might lose emotional nuances or a cultural context in the interviews and conversations.

6 Conclusion

Against the backdrop of the recent global refugee crisis, we discuss how ICT can support refugees in different regions across the world. We specifically focus on the role that ICT plays in supporting refugees' desperate journey to safety, temporary stay in settlement camps, and post-settlement inclusion in host countries. We identify seven core research themes: 1) accessibility to information, 2) availability of education and linguistic resources, 3) admissibility to labor markets and entrepreneurship opportunities, 4) communicability with home country, 5) connectedness with local population, 6) interactivity with the host government, and 7) volunteer coordination. Across all themes, we highlight the need to contextualize IS research designs. Research that examines ICT solutions for refugees could shed light on designing intercultural systems since visuals that refugees from different backgrounds can understand could serve as a central tool for intercultural understanding. Researchers should also incorporate future research on ICT-enabled refugee integration into the body of knowledge that several other IS subject areas have already acquired, such as IT adoption, designing intercultural interfaces, and information management. Finally, we call for more empirically grounded studies to enhance our understanding about how refugees leverage ICT.

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